



AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (480) 921-8044 • Fax: (480) 921-0049

Lic. No. AZ0003

17 August 2015

Ms. Debbie Tribioli
The Oasis at Anozira
c/o Kinney Management Services
6303 South Rural Road
Tempe, Arizona 85283

Ref: Oasis Lake, July 2015

Dear Ms. Tribioli:

The following report summarizes initial water quality data collected for Oasis Lake on 02 July 2015. Similar data have been reported each month and are used in this report to generate the initial graphs that will be used for tracking changes in water quality. The report also includes field data sheets reflecting lake and mechanical system conditions each week during the month.

Chemical and Physical Composition

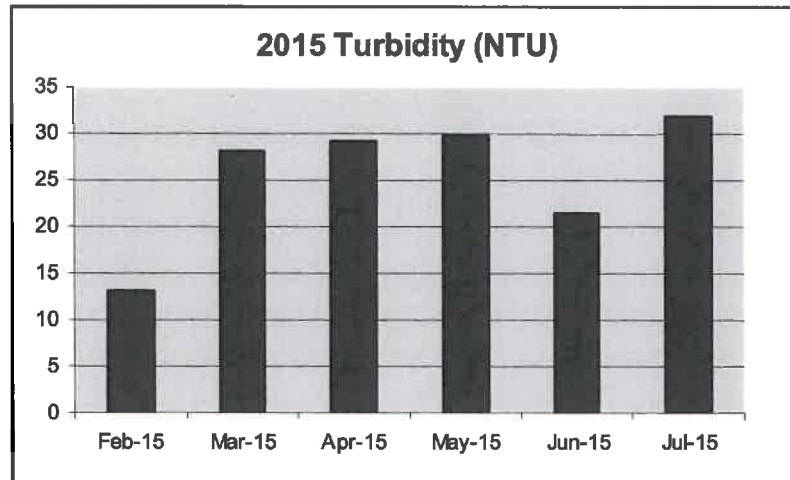
Temperature, Oxygen, and pH: Water temperature was 31.9 C (89 F) and the dissolved oxygen concentration was 10.1 mg/L. The amount of oxygen that can dissolve in water is temperature dependent; colder water can hold more oxygen than warmer water. At the time of sampling and despite a reduction in oxygen, the oxygen saturation was still over 100 percent, indicating maximum oxygenation and adequate operation of the aeration system. The dissolved oxygen content was also satisfactory for the fishery.

The table below shows the USEPA criteria for dissolved oxygen in warm water fisheries.

Criterion	Early life stages	Other life stages
Daily mean	>6.0	>4.0
Daily minimum	>5.0	>3.0

Water temperature tolerance varies among fish species. However, the maximum weekly temperature tolerance of most common urban lake fish species is 32 to 35 C.

Turbidity: The turbidity of the lake water increased to 26.9 NTU. Water turbidity is impacted by dissolved and particulate matter in the water. As turbidity increases, clarity and aesthetic quality decreases. Increased turbidity may have resulted from storm water discharges in late June.

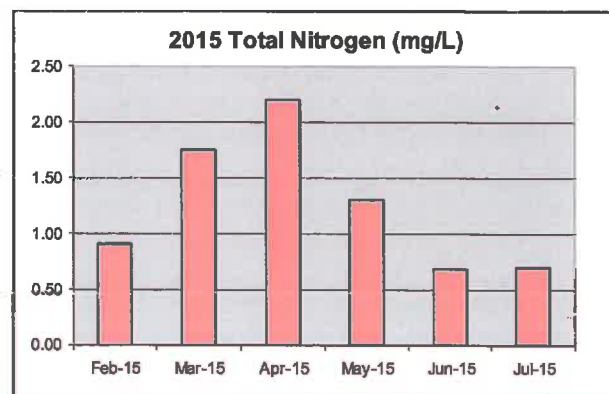
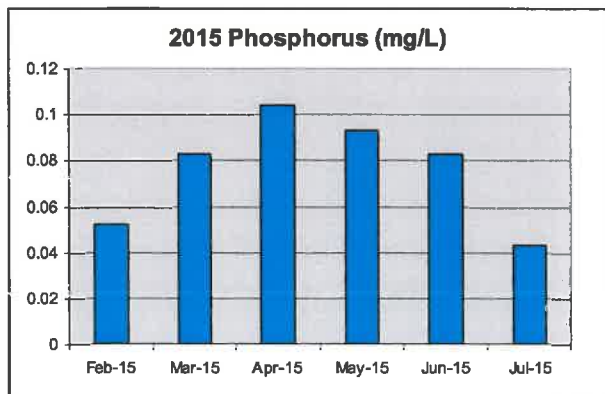


pH: The lake water pH decreased to 8.2, within the desired range. Water pH is influenced by the chemical makeup of the water and the amount of algae in the lake. In a very simplified explanation for the role of algae, carbonic acid in the water is formed from dissolution of carbon dioxide. Carbonic acid tends to make the water more acidic and pH decreases. However, algae utilize carbon dioxide during photosynthesis during daylight, making less carbon dioxide available to form carbonic acid, and pH increases. The more algae present, the greater the increase in pH.

High pH can be problematic in terms of toxicity if high concentrations of ammonia are present in the water. Ammonia is in equilibrium between two forms; ammonium ion and ammonia gas. At pH concentrations above 9.0 SU, ammonia converts to the gas which is toxic to many aquatic organisms. At pH 8.2, ammonia would not have a significant adverse impact on the fishery. No signs of fish stress were observed.

Nutrients: Nitrogen and phosphorus are the primary nutrients that stimulate algae and submerged plant growth. Phosphorus is typically the nutrient that dictates how much plant growth can be sustained in a lake. Usually if the total phosphorus concentration is below 0.030 mg/L, low levels of suspended algae occur. A nitrogen concentration of about 10 times the phosphorus (0.30 mg/L) is typically needed to support algal growth.

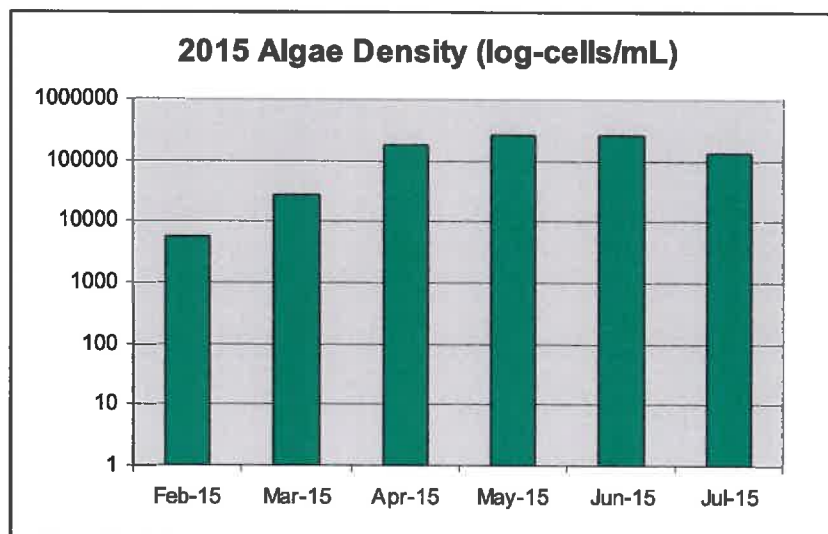
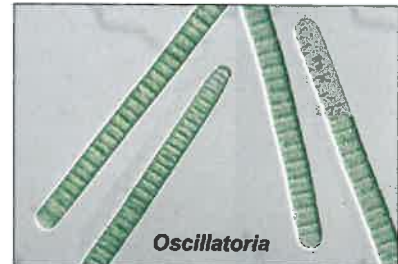
The total nitrogen concentration was relatively unchanged at 0.70 mg/L as N. The phosphorus concentration decreased to 0.043 mg/L as P. These data indicate that, although decreasing in concentration, the lake has sufficient nutrients to support a high density algae population which is reflected in the phytoplankton data.



Biological Composition

Phytoplankton (algae): The amount and types of algae in a lake dictate the aesthetic and operational quality of the water. Algae density affects the clarity and color of the water, two very important aesthetic criteria. The species composition dictates the form of growth observed; floating mats, suspended cells, stringy attached filaments, etc. It also impacts the choice, frequency, and dosage of herbicides used for water quality management.

The total algae density in the lake decreased to 1.29×10^5 cells per mL; considered in the elevated category for an urban reservoir in metro-Phoenix. Increased day length, water temperature, and solar intensity are likely responsible. The dominant alga in Oasis Lake was *Oscillatoria*, a filamentous blue-green (Cyanophyta) form. Blue-green filamentous algae tend to produce stringers on the lake edge or floating masses on the lake surface. However, this did not occur. The potentially toxic (to fish) alga, *Prymnesium parvum*, was not detected in the lake water.



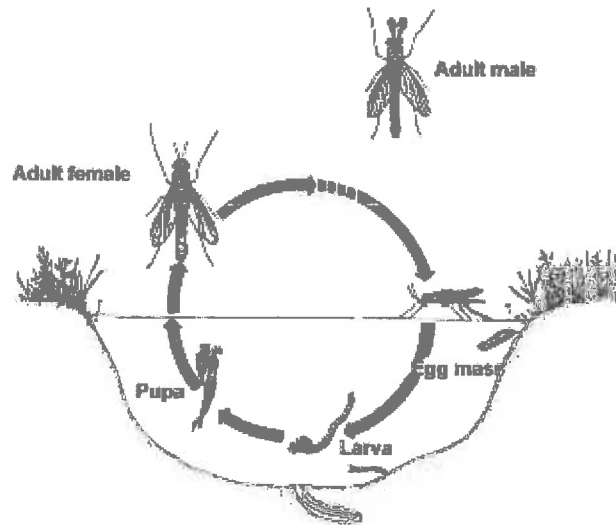
Submerged weeds were detected in the lake.

A dye application was initially made on 11 June to reduce light penetration into the water column and reduce available light to algae, and to improve water color. The color began declining slowly during the month of July.

Midge flies: Midge flies are common inhabitants of most lakes. Adult females lay hundreds of eggs on the water surface. The



eggs settle to the lake bottom and hatch in a few days. Larvae develop and grow in the superficial sediments over a three to four week period. In about 30 days the insect larvae become pupae, rise in the water column, and emerge as adult flies. The life cycle is shown diagrammatically below. The Adults tend to swarm at dusk and dawn and become a nuisance. They fly into residents' eyes and mouths, congregate under eaves of houses, and leave a sticky messy residue when they die. Management techniques may include stocking of bottom-feeding fishes to consume the larvae and/or application of bacterial or chemical larvicides.



Minimal midge fly adults were detected during the month.

Fishery: Fish activity appeared normal. No dead fish were observed or reported during the month.

Waterfowl: Ducks and geese can be a beautiful sight on a small urban pond or lake. They seem to make the lake look more like a natural lake than an artificial reservoir. They are fascinating creatures. However, when ducks and geese become too numerous, several lake management and aesthetic problems can develop.

Bird droppings can be a nuisance and aesthetic detraction along the shoreline. The droppings create slippery conditions along the shoreline and certainly are not attractive in appearance. Because the droppings must be physically washed from the lake edge, they create an additional maintenance task. Some waterfowl, as geese can become aggressive to humans, especially after they have become accustomed to being fed human food. They can do significant damage to turf areas, ripping up and consuming grass. Water fowl are also a source of nitrogen and phosphorus; nutrients that stimulate algae growth in a lake and cause the water to turn green. Ducks like to forage vegetation from the land. They convert it to water-soluble forms of nitrogen and phosphorus during digestion. The wastes are then deposited in the lake while they swim. Bird wastes contain fecal bacteria. Because we sometimes fish and our children often play along the water's edge, hands or feet somehow find their way into the water.

Thus, the waste material can pose a health risk. Finally, some diving birds as cormorants are excellent fishermen. These birds have reduced the fish populations in some nearby lakes, consuming game fish and reducing recreational benefits. They have also removed fish that had been added for weed and insect control. Frequent fish restocking increases operational costs for the lake owner.

Arizona Game and Fish Department has developed the following criteria for waterfowl on small urban lakes.

Excellent	<3/acre
Good	3-4/acre
Fair	5-6/acre
Poor	>6/acre

Based on the Arizona Game & Fish Department scale, the lake condition in terms of waterfowl was excellent during the month. A reduced variety and number of ducks and no geese were observed during routine inspections. Cormorants were not observed.

In terms of public health protection, the *E. coli* bacteria concentration was 236 per 100 mL. The State swimming standard for *E. coli* is 235 and the secondary (partial body contact) standard is 575 per 100 mL. The lake water met the secondary contact standard. Storm water runoff may have contributed to the elevated bacteria concentration.

Mechanical Systems and Field Observations

Weekly field inspection forms are attached to this report. The lake was cleaned of surface debris weekly.

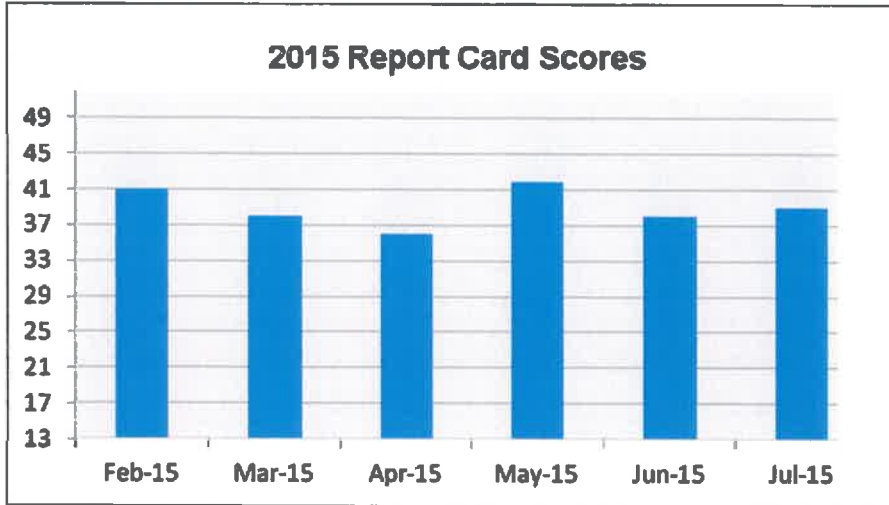
- Two (2) aerator diffuser stations continued to work poorly, but were functional.
- De-foaming agent was added to the west water feature.

Chemical/Biological Product Applications

A maintenance amount of two (2) gallons of lake dye (Key Colour-Midnight Blue) was added to the lake on July 30.

Lake Report Card

The water quality data are summarized on the attached Oasis Lake Report Card. Each salient parameter has been qualitatively evaluated and then assigned a numeric value for comparison and tracking purposes. The overall rating increased from 38 to 39, primarily as a result of improved pH and a lower phosphate concentration. Report card scores for the year are summarized below.



Respectfully,

AQUATIC CONSULTING & TESTING, INC.

Frederick A. Amalfi, Ph.D., C.L.M.
Laboratory Director





LABORATORY REPORTS



FIELD INSPECTION FORMS



PESTICIDE APPLICATION DOCUMENTS



AQUATIC CONSULTING & TESTING, INC.

1525 W. University Drive, Suite 106
P.O. Box 1510
Tempe, Arizona 85281
Phone: (480) 921-8044 • Fax: (480) 921-0049

Lic. No. AZ0003

LABORATORY REPORT

Client: Oasis at Anozira
c/o Kinney Management Services
6303 S. Rural Road
Tempe, Arizona 85283

Date Submitted: 07/02/15
Date Reported: 08/04/15

Attn: Debbie Tribioli

Project: Monthly Lake Monitoring

RESULTS

Client ID: Lake
ACT Lab No.: BX06058

Sample Type: Surface Water
Sample Time: 07/02/15 08:30

<u>Parameter</u>	<u>Analysis Date</u>		<u>Method No.</u>	<u>Result</u>	<u>Unit</u>
	<u>Start</u>	<u>End</u>			
Algae Count	07/14/15	07/14/15	SM 10200 F	See Attached	cells/mL
Algae Identification	07/14/15	07/14/15		See Attached	
Oxygen, Dissolved Field	07/02/15	07/02/15	SM4500 O G	10.1	mg/L as O2
pH, Field	07/02/15	07/02/15	SM4500H+ B	8.2	SU
Temperature, Field	07/02/15	07/02/15	SM2550 B	31.9	C
Nitrate + Nitrite - N	07/15/15	07/15/15	SM4500NO3 E	<0.05	mg/L as N
Phosphorus, Total	07/06/15	07/06/15	365.3	0.043	mg/L as P
Total Kjeldahl Nitrogen	07/07/15	07/07/15	SMNorg C,NH3 C/D	0.7	mg/L as N
E. coli, Collert	07/02/15	07/03/15	SM 9223 B	236	MPN/100 mL
Turbidity	07/02/15	07/02/15	180.1	26.9	NTU

Reviewed by:

Frederick A. Amalfi, Ph.D.
Laboratory Director

ALGAE IDENTIFICATION

AC&T Lab No.	BX06058	Date Collected	07/02/15
Client I.D.	Lake	Collected By	AC&T/FAA

Divisions: bac=Bacillariophyta; chl=Chlorophyta; cry=Chrysophyta; cyn=Cyanophyta; eug=Euglenophyta; hap=Haptophyta; pyr=Pyrrhophyta
Forms: u=unicell; c=colony; f=filament; g= flagellate

Genus	Div.-Form	Rel. Count	Total per mL	Comp.	Genus	Div.-Form	Rel. Count	Total per mL	Comp
<i>Achnanthes</i>	bac-u				<i>Microcystis</i>	cyn-c			
<i>Anabaena</i>	cyn-f				<i>Microspora</i>	chl-f			
<i>Ankistrodesmus</i>	chl-u				<i>Mougeotia</i>	chl-f			
<i>Aphanocapsa</i>	cyn-c				<i>Navicula</i>	bac-u	3	1411	1.09%
<i>Asterionella</i>	bac-c				<i>Nitzschia</i>	bac-u			
<i>Botryococcus</i>	chl-c				<i>Oocystis</i>	chl-c			
<i>Carteria</i>	chl-ug				<i>Oscillatoria</i>	cyn-f	175	82328	63.87%
<i>Cephalomonas</i>	chl-ug				<i>Pandorina</i>	chl-cg			
<i>Ceratium</i>	pyr-ug				<i>Pediastrum</i>	chl-c			
<i>Chlamydomonas</i>	chl-ug	4	1882	1.46%	<i>Peridinium</i>	pyr-ug			
<i>Chlorella</i>	chl-u				<i>Phacotus</i>	chl-ug			
<i>Chlorococcum</i>	chl-c				<i>Phacus</i>	chl-ug			
Chroococcus	cyn-c	28	13172	10.22%	<i>Pinnularia</i>	bac-u			
<i>Chroomonas</i>	crp-ug				<i>Pithophora</i>	chl-f			
<i>Closterium</i>	chl-u				<i>Prymnesium</i>	hap-ug			
<i>Cocconeis</i>	bac-u				<i>Rhizoclonium</i>	chl-f			
<i>Coelastrum</i>	chl-c				<i>Rhoicosphenia</i>	bac-u			
Cosmarium	chl-u	2	941	0.73%	<i>Rhopalodia</i>	bac-u			
<i>Cosmocladium</i>	chl-c				Scenedesmus	chl-c	16	7527	5.84%
<i>Crucigenia</i>	chl-c				<i>Scytonema</i>	chl-f			
<i>Cryptomonas</i>	crp-ug				<i>Selanastrum</i>	chl-u			
<i>Cyclotella</i>	bac-u				<i>Sphaerocystis</i>	chl-c			
<i>Cymbella</i>	bac-u				<i>Spondylumorum</i>	chl-c			
<i>Diatoma</i>	bac-u				Spirulina	cyn-f	30	14113	10.95%
<i>Dinobryon</i>	bac-c				<i>Stauroneis</i>	bac-u			
<i>Dunaliella</i>	chl-u				<i>Stephanodiscus</i>	bac-u			
<i>Epithemia</i>	bac-u				<i>Stigeoclonium</i>	chl-f			
<i>Euglena</i>	eug-ug				<i>Surirella</i>	bac-u			
<i>Fragilaria</i>	bac-u				<i>Synechococcus</i>	cyn-u			
<i>Frustulia</i>	bac-u				<i>Synechocystis</i>	cyn-c			
<i>Glenodinium</i>	pyr-ug				Synedra	bac-u	12	5645	4.38%
<i>Golenkinia</i>	chl-c				<i>Synura</i>	cry-cg			
<i>Gomphonema</i>	bac-u				Tetraedron	chl-u	4	1882	1.46%
<i>Gonium</i>	chl-cg				<i>Tetrastrum</i>	chl-c			
<i>Gonyaulax</i>	pyr-ug				<i>Trachelomonas</i>	eug-ug			
<i>Gyrosigma</i>	bac-u				<i>Vaucheria</i>	chl-f			
<i>Hydrodictyon</i>	chl-c				<i>Volvox</i>	chl-cg			
<i>Lyngbya</i>	cyn-f				<i>Zygnema</i>	chl-f			
<i>Melosira</i>	bac-f								
<i>Meridion</i>	bac-u								
<i>Merismopedia</i>	cyn-c								

check 100.00%

Aquatic Consulting & Testing, Inc.
1525 W. University Dr., Suite 106
Tempe, Arizona 85281

Count (cells/mL) 1.29E+05

Aquatic Consulting & Testing, Inc.

1525 W. University Dr. Ste. #106

Tempe, Arizona 85281

(480) 921-8044 Fax (480) 921-0049

Chain of Custody

Client Project Info:

Monthly Lake Monitoring
Oasis at Anozira

AC&T Client Reporting Information:

Oasis at Anozira
c/o Kinney Management Services
Attn: Debbie Tribioli
6303 South Rural Road
Tempe, AZ 85283
P: 480-820-3451
E: debbie@kinneymanagement.com

AAA

AC&T Sampler:

Sample Location ID: Lake Date: 7/2/15 Time: 0830 Matrix: SW

Sample Containers # / Preservation:

Non Preserved	2	1
N2S2O3 (Sterile)	1	1
HNO3 (Nitric)	1	1
H2SO4 (Sulfuric)	1	1
Lugols	1	1
Other:		

Field Measurements:
pH: 8.2
O2: 10.1
Temp: 31.0°C

Algae Count & ID X
Golden Algae X

Turbidity X
Total E.Coli-MPN X

Total Kjeldahl Nitrogen (TKN) X
Total Phosphorous (P-T) X

NO3+NO2 X

AC&T Laboratory Sample Identification
BX-06058

Page 1 of 1

1. RELINQUISHED BY:

Signature: *J. Amuth*
Print Name: J.F. Amuth
Date: 7/2/15 Time: 0920

2. RECEIVED BY:

Signature:
Print Name:
Date:
Time:

3. RELINQUISHED BY:

Signature: *T. Johnson*
Print Name: Tommy
Date: 7-2-15 Time: 09:20

4. RECEIVED BY:

Signature:
Print Name:
Date:
Time:

A C & T Sample Receipts

Total # Containers:	5
Custody Seals:	YES NO
Samples Intact:	YES NO
Samples On Ice:	YES NO
Ice Type:	WET BLUE
Sample Receipt Temperature:	29°C

Notes:

1 pres. P.M.

OASIS AT ANOZIRA FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 7/2/15
By: [Signature]

Aeration System Operation

operational Problem

Details: No issues; water level normal

cleaned west cove spray nozzels.

Lake Surface

Lake surface cleaning

Floating Fountains West East South

operational Problem Details: _____

Pump house housekeeping leaks ventilation lighting Notes OK

Compressors operational Problem Details: _____

Pumps operational Problem Details: _____

Entry Fountains

Elliot North: operational Screens cleared Problem Details: _____

Elliot South: operational Screens cleared Problem Details: _____

Los Feliz: operational Screens cleared Problem Details: _____

Monthly Chemistry & Biology

- Dissolved oxygen 10.1
- Temperature 31.9
- pH 8.2
- Algae ID and count
- Ammonia-N
- Organic N (TKN)
- Phosphorus
- Turbidity
- E. coli
- Golden algae (seasonal)



N/A

OASIS AT ANOZIRA FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 7/9/15
By: [Signature]

Aeration System Operation

operational Problem

Details: _____

Lake Surface

Lake surface cleaning

Cleaned west core spray nozzles

Floating Fountains West East South

operational Problem Details: _____

Pump house housekeeping leaks ventilation lighting Notes _____

Compressors operational Problem Details: _____

Pumps operational Problem Details: _____

Entry Fountains

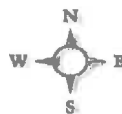
Elliot North: operational Screens cleared Problem Details: _____

Elliot South: operational Screens cleared Problem Details: _____

Los Feliz: operational Screens cleared Problem Details: _____

Monthly Chemistry & Biology

- Dissolved oxygen _____
- Temperature _____
- pH _____
- Algae ID and count _____
- Ammonia-N _____
- Organic N (TKN) _____
- Phosphorus _____
- Turbidity _____
- E. coli* _____
- Golden algae (seasonal) _____



OASIS AT ANOZIRA FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 7/16/15
By: AAA

Aeration System Operation

operational Problem

Details: Mud debris @ W + SW end
applied algicide for accumulated algae + defoam

Lake Surface

Lake surface cleaning

Floating Fountains West East South defoamed west

operational Problem Details: _____

Pump house housekeeping leaks ventilation lighting Notes _____

Compressors operational Problem Details: _____

Pumps operational Problem Details: _____

Entry Fountains

Elliot North: operational Screens cleared Problem Details: _____

Elliot South: operational Screens cleared Problem Details: _____

Los Feliz: operational Screens cleared Problem Details: _____

Monthly Chemistry & Biology

- Dissolved oxygen _____
- Temperature _____
- pH _____
- Algae ID and count _____
- Ammonia-N _____
- Organic N (TKN) _____
- Phosphorus _____
- Turbidity _____
- E. coli* _____
- Golden algae (seasonal) _____



OASIS AT ANOZIRA FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 7/23/15
By: Amc

Aeration System Operation

operational Problem

Details: _____

Lake Surface

Lake surface cleaning

Floating Fountains West East South

operational Problem Details: 2 weak aerators All running

Pump house housekeeping leaks ventilation lighting Notes _____

Compressors operational Problem Details: good

Pumps operational Problem Details: _____

Entry Fountains

Elliot North: operational Screens cleared Problem Details: _____

Elliot South: operational Screens cleared Problem Details: _____

Los Feliz: operational Screens cleared Problem Details: _____

Monthly Chemistry & Biology

- Dissolved oxygen 11.0
- Temperature 31.9
- pH 8.8
- Algae ID and count
- Ammonia-N
- Organic N (TKN)
- Phosphorus
- Turbidity
- E. coli
- Golden algae (seasonal)



OASIS AT ANOZIRA FIELD INSPECTION FORM (

wpdoc/lists&forms)

Date: 7/30/15
By: [Signature]

Aeration System Operation

operational Problem

Details: All working 2 poorly

Lake Surface

Lake surface cleaning

Floating Fountains West East South

operational Problem Details: _____

Pump house housekeeping leaks ventilation lighting Notes _____

Compressors operational Problem Details: _____

Pumps operational Problem Details: _____

Entry Fountains

Elliot North: operational Screens cleared Problem Details: _____

Elliot South: operational Screens cleared Problem Details: _____

Los Feliz: operational Screens cleared Problem Details: _____

Monthly Chemistry & Biology

- Dissolved oxygen 10.5
- Temperature 34.5
- pH 8.8
- Algae ID and count
- Ammonia-N
- Organic N (TKN)
- Phosphorus
- Turbidity
- E. coli
- Golden algae (seasonal)

* 2 galdye





AQUATIC CONSULTING & TESTING, INC.
1525 West University Drive, Suite 106
Tempe, Arizona 85281
Phone: 480-921-8044 Fax 480-921-0049

PESTICIDE TREATMENT NOTICE & RECORD

Client: The Oasis at Anozira
Attn: Debbie Tribioli The Oasis at Anozira C/O Kinney Management Services 6303 South Rural Road Tempe, Az 85283

Location: Lake on Anozira Parkway

Date: 07-30-15	Time: 11:30	Conditions: <input checked="" type="checkbox"/> clear <input type="checkbox"/> pt cloudy <input type="checkbox"/> overcast <input type="checkbox"/> cold <input type="checkbox"/> mild <input checked="" type="checkbox"/> hot
----------------	-------------	---

Material:	Reg. No. (*restricted)	Tot. Qty:	Acres/Volume:
Aquadye		2.0 gal	

Degree of infestation:

Dosage/rate	Percent active ingredient:
-------------	----------------------------

Applicator: A. Murrett	Cert. No. 061093
------------------------	------------------

Remarks/follow-up: Submerged Weed Prevention
--

Precautionary Statement:

Warning-Pesticides can be harmful. Keep children and pets away from pesticide applications until dry, dissipated, or aerated. For more information contact Aquatic Consulting & Testing, Inc. at 480-921-8044 and ask for Dr. Rick Amalfi. AC&T License No. 4418 F. A. Amalfi QP#1360 Cert. No. 900496